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“Tracing the journey of the Sun and the solar siblings through the Milky Way”

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The products of radioactive elements found in the meteorite fossil record and the high eccentricities of objects located in the outer regions of the Solar System, suggest that the Sun was born in an open cluster 4.6 Gyr ago. Such an open cluster however, was quickly destroyed by the intense gravitational field of the Galaxy. As a consequence, the stars that were born together with the Sun, the so-called solar siblings, might be currently dispersed all over the Galactic disk. In this talk I will explain how open cluster simulations can help us in predicting the current phase-space coordinates of the solar siblings. These simulations include the gravitational forces within the cluster, the effects of stellar evolution on the cluster population and the gravitational force due to the Milky Way. The result of these simulations will serve as a guide to search for solar siblings in future surveys such as the Gaia mission and GALAH. The identification of solar siblings is of crucial importance to understand the environment where the Solar system was formed and the place in the Galaxy where the Sun was born.